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Review

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Lumbar artery perforator free flaps for breast reconstruction

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Abstract

Despite its technical complexity, the lumbar artery perforator (LAP) flap remains a valuable asset in the realm of autologous breast reconstruction, providing an option for patients who may not be suitable candidates for abdominal flaps. The LAP flap offers dimensions and volume suitable for recreating a natural breast shape, including a sloping upper pole and optimal projection in the lower third. Harvesting LAP flaps can also lead to simultaneous improvement in body contour by lifting the buttocks and narrowing the waist, following the principles of aesthetic body lift procedures.

Keywords: Breast reconstruction, lumbar artery perforator flap, microsurgery

INTRODUCTION

Breast reconstruction, either implant-based or autologous tissue, is a crucial component to the care of breast cancer patients. Autologous free tissue transfer has many advantages over implant-based reconstruction, as it provides a more natural appearance to the breast, longer-lasting results, more satisfying nipple areola complex (NAC) outcomes, and an overall more satisfying reconstructive outcome for patients[1,2]. Patients undergoing autologous tissue reconstruction have been shown to have increased satisfaction with their breast reconstruction, overall outcomes, and quality of life[3-5].

Perforator-based flaps are the cornerstone of autologous breast reconstruction[6]. The lumbar artery perforator (LAP) flap is a perforator flap based on the deep lumbar artery perforators that arise from the aorta, and course superficially to supply the skin and subcutaneous tissue of the lumbar region[7-9] [Figure 1]. This fasciocutanous flap is not associated with any functional defects and pain at the donor site is de minimus as a result of the muscle-preserving approach. This highly versatile flap was first described as a pedicled flap for loco-regional coverage of sacral pressure sores and midline back defects[10,11]. The LAP flap was then described as a free flap for breast reconstruction by de Weerd *et al.* as an alternative for patients with relative contraindications for abdominally-based flap breast reconstruction[12]. In the years since de Weerd's publication, the LAP flap has slowly been gaining popularity, primarily as a "secondary" flap option for breast reconstruction, typically utilized when the abdomen is not a sufficient or suitable option[12].

While abdominally-based free flaps are the most frequently used donor site for autologous breast reconstruction, patients lacking sufficient abdominal tissue or with a history of abdominal surgery that precludes the use of the abdominal donor site may require other flap options to achieve breast restoration[13]. While thigh-based flaps provide reliable outcomes and high patient satisfaction, they often necessitate stacking of flaps to provide adequate tissue for breast reconstruction and donor scar placement can be challenging[11,12]. Thigh-based flaps have also been shown to have high rates of wound healing complications and unfavorable donor site aesthetics[14,15]. Trunk-based flaps such as the LAP flap are an alternative option that can facilitate aesthetic breast reconstruction with superior results to thigh flaps at the donor site. It is our thesis that donor sites for reconstructive surgery should mimic the principles of aesthetic body contouring. The tissue utilized with a LAP flap is fairly analogous to that removed during a lower body lift and, therefore, has the net effect of lifting the buttocks and narrowing the waistline[16,17]. For this reason, we consider the LAP flap donor site preferable to horizontally based thigh and buttock flaps, as the latter donor sites do not have corollaries in body contouring surgery. That said, the LAP flap, like the superior gluteal artery perforator (SGAP) flap, is associated with higher flap failure rates than abdominally-based and thigh-based flaps due to short vascular pedicles and increased complication rates, and this should be considered and discussed with potential LAP candidates as part of the informed consent process[14-16].

Taken together, the seminal studies reporting the LAP flap demonstrate that a flap with a skin island measuring up to 12 cm × 27 cm and with adequate soft tissue volume to create a breast can be harvested on a single perforator[18]. In our experience, however, the maximal short-axis ("vertical height") of the skin ellipse should be limited to approximately 7-8 cm to avoid excessive tension on the donor site closure in most patients. A sensory nerve can be harvested for neurotizing a LAP flap[18]. The lobular structure of the fat of the lumbar region makes it possible to reconstruct breasts with excellent projection and overall contour, including a sloping upper pole[17]. Drawbacks of this donor site include limited surface area of the skin island and difficulty sculpting the skin island and flap itself due to the structural nature of the fat of the donor site region[19].

CLINICAL CONSIDERATIONS

The LAP flap is a valuable tool for a reconstructive surgeon and the donor site is generally acceptable to patients given that it mimics a posterior lower body lift, thereby narrowing the waist and lifting the buttocks[17,18]. The LAP flap donor site provides fat that is organized into lobules that are firmer than those of the abdominal wall, and thus provides for relatively greater projection than can typically be achieved with an equivalent volume of abdominal soft tissue. A LAP flap can, and when used for breast reconstruction, should be harvested with a shape that resembles an anatomic implant [Figure 2]. The surgeon must recognize that the shape of the reconstructed breast is largely determined during the harvest of these flaps, as the lumbar soft tissue is relatively firm and thus not amenable to the kind of folding and manipulation

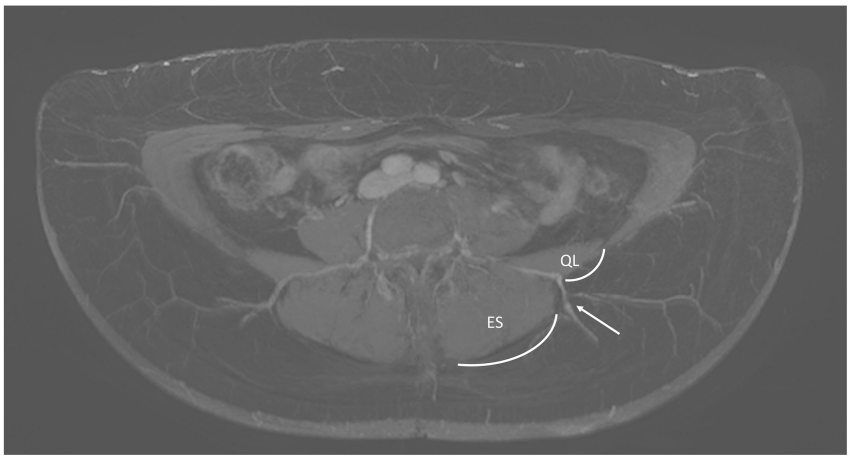

Figure 1. Preoperative MRA of lumbar perforator vessels. MRA: Magnetic resonance angiogram; ES: erector spinae; QL: quadratus lumborum.

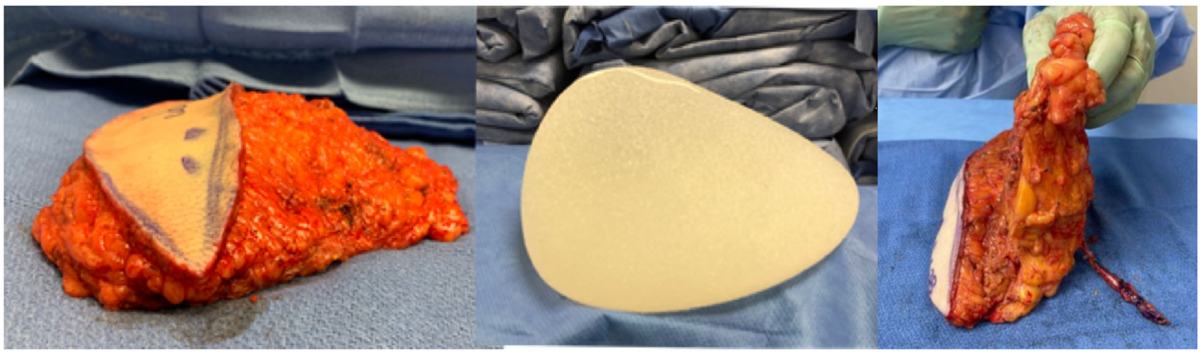

Figure 2. Comparison of LAP flap to anatomic implant. LAP: Lumbar artery perforator.

that are typically done with other flaps such as deep inferior epigastric perforator (DIEP) and profunda artery perforator (PAP). Despite the advantages of the LAP flap, it is far from the gold standard for autologous breast reconstruction. The flap failure rate is 6%-10%, much higher than the 1%-2% flap failure rates seen in DIEP flaps[19-21]. Donor site seroma is also common in LAP flap reconstruction, and donor site numbness and paresthesia can be issues[19]. As such, most providers who offer LAP flap reconstruction do not consider the LAP flap as a primary donor site option and, therefore, reserve this flap for patients who require autologous breast reconstruction but do not have adequate abdominal tissue[18].

In our practice, patients who undergo LAP flap breast reconstruction often have few, if any, acceptable alternative donor sites in the event of a LAP flap failure. Backup procedures to the LAP flap are determined on a case-by-case basis, taking into account patient anatomy and patient preference. Implant-based breast reconstruction or pedicled latissimus in the case of flap failure may be options.

LAP flap harvest and successful microsurgical transfer are, in comparison to DIEP flap surgery, significantly more technically challenging, and thus, significant microsurgical experience with complex perforator microsurgery is suggested before attempting these procedures. The LAP flap pedicle is typically 2-4 cm because dissection should be limited to that portion of the perforator vessel that is anatomically posterior to the level of the transverse processes tips of the vertebral bodies[22]. Anterior to this plane, the risk of injury to

the dorsal sensory ganglia increases significantly, especially if bleeding from the thin-walled venae comitantes is encountered. Further, at the level that the vascular pedicle must be divided to avoid the risk of nerve injury associated with dissection in the region of the dorsal sensory ganglia, the caliber of the artery is narrow, ranging from 0.8 to 1.2 mm[19]. Finally, to add to the technical challenges of flap harvest, the LAP venae comitantes are thin-walled and thus can easily tear and bleed.

Pedicle dimensions and the typical size mismatch encountered between the flap artery and the recipient artery dictate that interposition arterial and venous grafts between the flap pedicle and the recipient vessels are almost universally beneficial. The use of grafts helps reduce the risk of thrombosis and flap failure[22,23]. Additionally, a short vascular pedicle [without the use of interposition arteriovenous (AV) grafts] severely constrains the options for insetting a flap at the chest and potentially compromises the aesthetic outcome of the reconstruction.

Although the senior author has performed bilateral simultaneous LAP flap breast reconstruction, given the complexity of the procedure, the potential for prolonged ischemia time for one or both flaps in simultaneous procedures, and reduced failure rates reported after transitioning from bilateral simultaneous to staged unilateral procedures, we currently favor the staged approach for patients requiring bilateral LAP flap breast reconstruction[21,23].

RELEVANT VASCULAR ANATOMY

The lumbar vasculature most commonly arises from the posterior abdominal aorta as 4 paired vessels[9]. These perforators can be musculocutaneous or septocutaneous, and the latter provides the basis for the LAP flap. The lumbar perforators initially traverse a course between the vertebral bodies and the psoas major muscles [Figure 1]. The vessels then run posterolaterally between the erector spinae and quadratus lumborum muscles to pass through the thoracolumbar fascia and enter the subcutaneous tissue approximately 7 to 10 cm lateral to the posterior midline[20]. Generally, the diameter of the vessels increases from L1 to L4 levels. The L4 perforator is frequently the most ideal perforator upon which to base a LAP flap as these vessels are among the largest in caliber, have septocutanous anatomy, and are found anatomically superior to the bony pelvis. The L5 perforators are sometimes the largest in diameter; however, the L5 perforators can be adherent to the pelvic bone and, in such circumstances, are particularly challenging to dissect[8].

Typical lumbar artery diameter is 0.8-1.1 mm, and the associated veins are approximately 2 mm in diameter at the level at which the pedicle is harvested. We typically find that either DIEP or TD grafts (both artery and vein), when dissected to length, reasonably match the lumbar flap pedicle with respect to both arterial and venous diameter. The proximal ends of these grafts match the internal mammary recipient vessels well.

Preoperative imaging to map perforator anatomy is, in our experience, an essential step in planning LAP flap harvest. Because the perforators that supply the distribution of the LAP flap penetrate the thoracolumbar fascia approximately 7 cm lateral to the posterior midline, they inherently enter the subcutaneous fat of the flap beneath a narrow portion of the skin island. It is essential to design the flap to capture the best perforator(s). Magnetic resonance angiography is the preferred modality as it avoids the abdominopelvic radiation associated with high-resolution CT angiography, although the disadvantages of this technique are cost and availability[18].

Compromising the spinal cord blood supply by accidentally injuring a spinal artery may cause ischemia and devastating complications. The artery of Ademkiewicz arises between T8 and L1 and is avoided with proper perforator selection[24].

PREOPERATIVE PLANNING

Women who have sufficient fatty tissue in the lumbar area are candidates for LAP flap reconstruction. Pinch test and physical exam[18] are used to assess the donor site for adequacy of soft tissue and for the degree of laxity in the lower back and buttock, which is essential to allow closure of the donor site with appropriate tension and contour. Patients who have sufficient tissue in the "love handle" are considered for LAP reconstruction. Soft tissue volume and laxity necessary for closure should be assessed clinically by the surgeon in the same way they would assess a patient for a cosmetic lower body lift contouring procedure. As a rule of thumb, patients whose anatomy would allow them to theoretically be a candidate for a posterior body lift with excision of lover back tissue are potential candidates for LAP flap harvest. The lumbar region and upper gluteal fat are harvested based on the surgeon's clinical assessment such that a tension-free closure can be achieved while also aesthetically lifting the buttock, accentuating lumbar lordosis, and narrowing the waistline. The volume and shape of the flap obtained and thus the reconstructed breast vary greatly with patient body habitus. The authors believe that secondary deformity at donor sites should be avoided at all costs in the breast reconstruction population, as poor donor sites for free flap reconstruction serve to shift the defect from one area of the body to another. This is not ideal in any patient but resonates especially for patients who undergo elective prophylactic mastectomies and are seeking increased quality of health and life with their reconstructive outcomes[25,26]. If aesthetic principles are followed when harvesting donor tissue, the donor site will have an ideal outcome.

The skin island of the LAP flap is generally not more than about 7 cm in its maximal vertical dimension; however, in some cases, up to 12 cm of vertical skin island height can be obtained at the center of the ellipse [Figure 3]. The skin island of the flap will inherently be located over the lower 1/3rd of the flap, thus limiting the extent to which LAP flaps can be utilized for patients who require skin envelope restoration. The limitations of skin island surface area and position must be carefully considered preoperatively; this is especially the case for patients who have previously been irradiated, for those undergoing purely delayed reconstruction, and for those who otherwise have significant skin-envelope restoration requirements.

Special consideration is given to the use of grafts in bilateral cases in those patients who have inadequate abdominal soft tissue for bilateral reconstruction but for whom a 3- or 4-zone abdominal flap would provide adequate tissue for unilateral breast reconstruction. For such patients, our preference is to use DIEP grafts ipsilateral to the breast being reconstructed first. When the second breast is reconstructed, the use of the contralateral TD graft preserves the ability to harvest abdominal tissue based on the DIEP pedicle on one side of the abdomen, with or without additional vessels (including the superior epigastric or superficial inferior epigastric) from the side from which the DIE vessels were already used. In the event of failure of the second side, this scenario preserves the ipsilateral latissimus/TD system and 3- or 4-zone abdominal perforator flap. The surgeon should be mindful to try to preserve as many potential secondary options as possible when selecting grafts.

Although the senior author performs other free flap breast reconstruction on patients with known hypercoagulable conditions, we presently consider hypercoagulable conditions such as Factor V Leiden, Protein C and S deficiencies, *etc*., as strong relative contraindications to LAP flap surgery. Prior spine surgery in the lumbar area is not an absolute contraindication, but a detailed surgical history and discussion with a spine surgeon are prudent ahead of these procedures for patients with such a history. We also recommend the use of preoperative magnetic resonance angiogram (MRA) to map perforator anatomy.

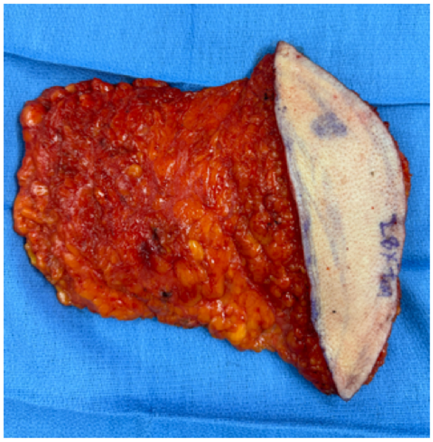

Figure 3. Skin island oriented on lower 1/3 of a 28 cm × 7 cm LAP flap. LAP: Lumbar artery perforator.

OPERATIVE TECHNIQUE

While it is possible to perform this procedure without a position change if one performs the entire procedure with the patient in the lateral decubitus position (as has been previously described and then abandoned by others[23]), we prefer to optimize every step of the procedure and thus always begin with the patient in the supine position to prepare the recipient site vessels. LAP flap reconstruction, therefore, involves repositioning the patient one or more times during the case.

Our preferred operative sequence is as follows.

Marking

The ipsilateral lumbar region is used for breast reconstruction. The LAP flap is bordered anteriorly by the anterior superior iliac spine (ASIS) and posteriorly by the midline. The flap's vertical alignment must be adjusted to position the selected perforator(s) beneath the skin island. The vertical height of the skin island is determined through a pinch test, and the skin island is configured in an elliptical shape. Markings are made over the upper gluteal fat to guide the non-anatomic dissection that will shape the upper two-thirds of the reconstructed breast, primarily from gluteal fat incorporated into the flap [Figure 4].

Recipient site preparation

Recipient vessels are dissected following mastectomy or, in the case of delayed reconstruction, after the breast pocket has been dissected and prepared. The internal mammary vessels are the preferred recipients for lumbar flap reconstruction. Preparing the recipient site before flap harvest minimizes ischemia time for the flap(s). Thoracodorsal (TD) vessels can also serve as recipients; however, modifications to the method of reconstruction described herein are suggested to best align the vascular pedicle and shape the breast when connecting to recipients at the lateral chest wall; specifically, a contralateral, rather than an ipsilateral lumbar donor site should be considered if the TD vessels will be used as recipients. Once the recipient site is prepared, the chest is closed temporarily with a sterile occlusive dressing.

AV graft harvest

Interposition grafts, when harvested from the abdominal wall, can also be prepared during this initial stage of the reconstruction. To prevent unnecessary ischemia time for the grafts, we prefer to dissect, but not ligate, the desired length of vessels at this stage of the procedure. The length of the DIE grafts obtained is

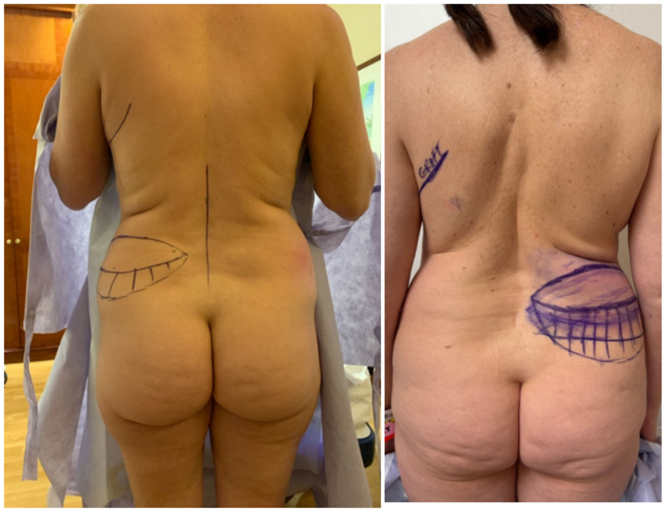

Figure 4. LAP flap markings. LAP: Lumbar artery perforator.

equivalent to the sub rectus muscular segment of these vessels from their origins off the external iliac up to the point where they enter the undersurface of the muscle or until the arterial vessel diameter tapers to approximately 1 mm. For TD AV grafts, the length is from the origin at the subscapular artery until the arterial diameter tapers to 1 mm. The graft donor site is temporarily closed with a sterile occlusive dressing and the patient is repositioned into either lateral decubitus or prone position.

Interposition AV grafts from the deep inferior epigastric system are obtained through a small lower abdominal incision near the pubic hairline. After incising the skin and dissecting down to the rectus fascia, the muscular fascia is incised longitudinally at the lateral border of the rectus sheath parallel to the fascial fibers. The lateral border of the rectus muscle is reflected medially and the deep inferior epigastric pedicle is exposed where it lies in the sub-muscular position [Figure 5A]. The lateral motor nerves should be carefully protected and maintained. The deep inferior artery and its venae comitantes are dissected free of the enveloping fat to the desired length.

TD AV grafts can also be used if the deep inferior epigastric vessels are not preferred or available. Consideration should be given to using the TD system contralateral to the breast being reconstructed to maintain ipsilateral TD and latissimus flap viability in case of a LAP flap failure. The TD vessels can be exposed just beyond the anterior border of the latissimus dorsi with the patient in either prone or lateral position. The TD pedicle is exposed on the undersurface of the latissimus muscle and dissected into the axilla superiorly and to the takeoff of the serratus branch inferiorly. Ligation and harvest of these grafts are deferred until completion of the LAP flap harvest [Figure 5B].

LAP flap elevation

The ipsilateral lumbar region is used as the donor site for breast reconstruction in the majority of cases, as our preferred recipient vessels are the internal mammary artery and vein(s). An ipsilateral flap will be rotated 180 degrees after harvest, so the anatomically inferior aspect of the flap will become the sloping upper pole of the reconstructed breast. The surgeon must thus capture sufficient gluteal soft tissue, inferior to the inferior border of the skin island, to achieve the desired breast shape.

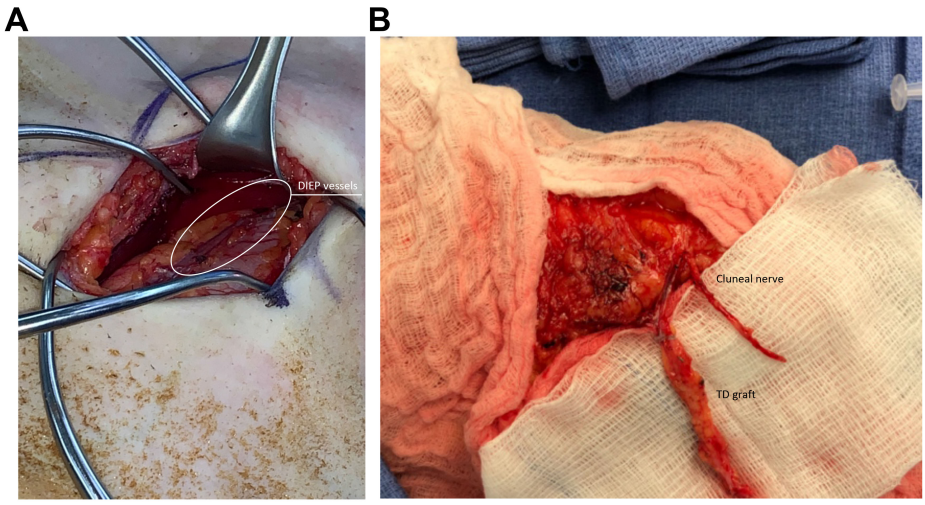

Figure 5. AV graft exposure and harvest. AV: Arteriovenous.

The skin paddle markings are incised, and the superior incision is deepened using cautery to dissect through the subcutaneous fat to the level of the underlying fascia. Very little beveling is done along this border of the flap. The inferior border of the skin island is deepened with the cautery, and significant beveling below the skin of the buttock is done to capture a considerable amount of gluteal fat into the flap [Figure 6]. This allows the surgeon to "sculpt" the flap into the necessary shape for breast reconstruction. The surgeon must include gluteal fat into the flap as this soft tissue will form the upper one-half to two-thirds of the reconstructed breast.

The posterior midline is an area where the surgeon should take caution with dissection to avoid undercutting the flap and to avoid a hollowed-out appearance at the donor site.

Once the peripheral borders of the flap have been developed, the flap is elevated from the medial to lateral if the patient is in prone position, or from lateral to medial if the patient is in the lateral decubitus position. The lumbar perforators are identified as they emerge through the glistening white thoracolumbar fascia [Figure 7].

Once the desired perforator(s) are identified, the thoracolumbar fascia is incised to gain the exposure needed to dissect the lumbar perforator(s). The vessels are followed retrograde in the septal plane between the quadratus lumborum and erector spinae muscles until a depth corresponding with an imaginary line passing through the tips of the transverse processes of the vertebral bodies [Figure 7]. Importantly, dissection is terminated at the level of the tip of the vertebral transverse process associated with the pedicle to protect the dorsal sensory ganglion and deeper vasculature. Dissection anterior to the tip of the transverse process, in our view, is dangerous given the relationship of the vessels to the dorsal sensory ganglia and the potential for bleeding in an area where gaining control of bleeding could cause significant morbidity. The vascular pedicle is typically 2-4 cm in length once the pedicle is ligated at this level. L5 perforator dissection is particularly tedious as these particular vessels need to be freed from the densely adherent periosteum of the pelvic margin; utmost care must be taken to prevent bleeding from branches that course down into the pelvis. Completion of flap harvest is achieved following division of the vascular pedicle by dividing the remaining soft tissue attachments on the undersurface of the flap with the cautery.

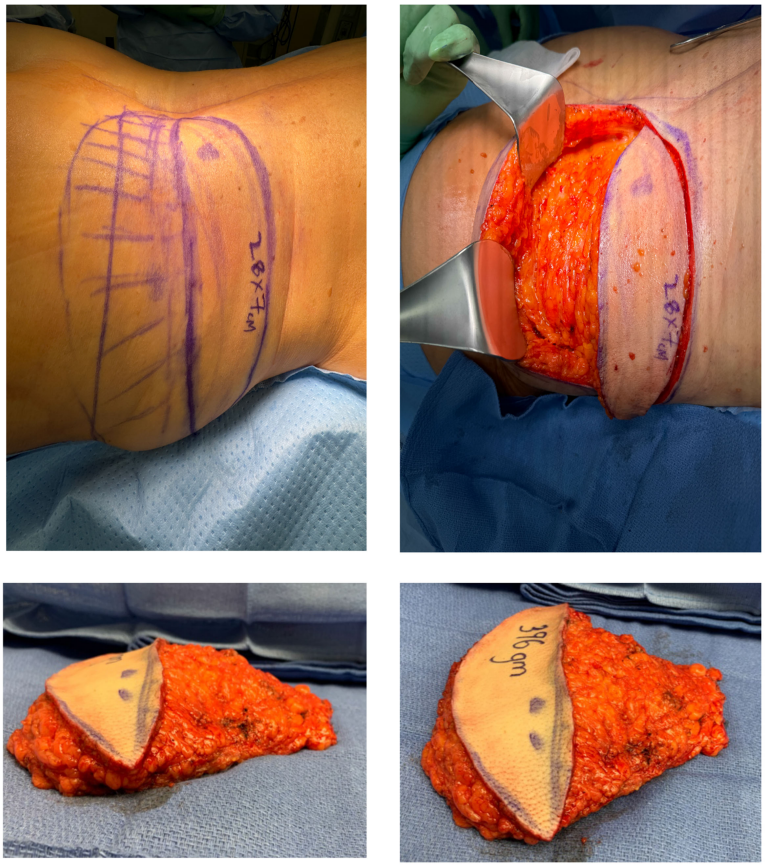

Figure 6. LAP flap elevation and harvest. LAP: Lumbar artery perforator.

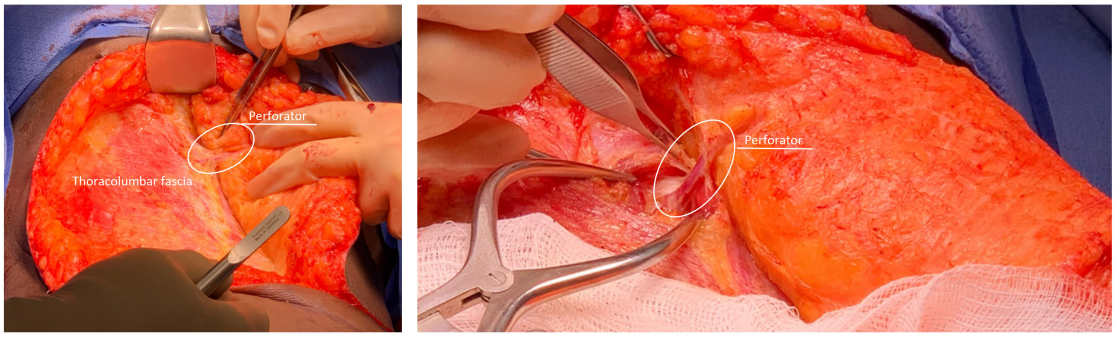

Figure 7. Perforator dissection.

If, during the course of elevation of the undersurface of the flap, a sensory cluneal nerve is observed to enter the underside of the flap, the nerve can be incorporated into the flap for the option of neurotization [Figure 7]. Other than a sensory nerve that enters the undersurface of the flap, cluneal nerves that are encountered during flap elevation should be preserved. Division of cluneal nerves can contribute to donor site numbness and paresthesia[27]. If large sensory nerves that are not incorporated into the flap must be divided, consideration should be given to primary nerve repair.

Once the LAP flap has been harvested, the next step in the sequence will depend on the vascular graft site being used and the patient's positioning. If possible, the AV grafts are harvested immediately after the flap and anastomosed to the LAP pedicle on the back table of the operating room by one surgeon while another surgeon closes the LAP donor site over drains. If grafts are inaccessible at this stage, the donor site should be closed and the surgeon should then proceed with repositioning and graft harvesting.

"Back table" microsurgery

Regardless of when AV grafts are harvested in the operative sequence, they are anastomosed to the pedicle on the back table of the operating room [Figure 8]. We find this approach to be the most technically straightforward approach. The arterial anastomosis is frequently coupled with a 1.0 or 1.5 mm coupler, provided that the media of the vessels is thin enough to enable the vessel to be everted over the coupler prongs without fracturing the intima [Figure 5B]. The arterial anastomosis is hand-sewn with 10-0 suture if the vessel walls cannot be everted appropriately. The venous anastomosis is coupled in standard fashion (2-2.5 mm coupler size). While the back-table anastomosis work is being completed, the LAP donor site is closed in layers over drains that are draped over the thoracolumbar fascia. It is important to close the thoracolumbar fascia to avoid lumbar hernia, a rare but recognized complication of this surgery[28]. We prefer to leave 1-2 cm of the fascia open just above the pelvic bone to reduce the risk that postoperative bleeding could produce nerve compression from hematoma near the spine. To facilitate drain care, the drain site is positioned anteriorly near the ASIS. Negative pressure dressings are used over the donor site closure to facilitate healing and provide added soft tissue stability against shearing forces that will necessarily occur at the donor site as the patient lays and sits on this area. If TD AV grafts were used, the donor site may be closed over a drain while the patient is still prone.

Flap anastomosis and inset

The patient is then repositioned to supine to anastomose the open end of the AV grafts to the recipient site vessels. Ipsilateral donor site flaps must be rotated 180 degrees to position the pedicle medially and use the gluteal fat to shape the superior pole of the reconstructed breast. Once the anastomosis has been completed, the flap is inset with the skin paddle in the lower third of the reconstructed breast and closed over a drain.

Anastomoses of the proximal ends of a TD AV graft or a DIE AV graft to internal mammary recipient vessels resemble the experience of anastomosing a free TDAP or DIEP flap to the internal mammary vessels. Nevertheless, because inadvertent tension on the fragile anastomoses between the grafts and the LAP pedicle must be avoided at all costs, and because there is a significantly higher revision rate for vascular anastomosis in lumbar artery perforator flap reconstruction, we almost always remove a single costal cartilage and prepare a longer length of recipient vessels than we would for DIEP flap or free TDAP flap.

POSTOPERATIVE CONSIDERATION

Second-stage procedures to optimize the donor and recipient sites are almost always required and are done 3 months after the reconstruction. The flaps are often reshaped to sculpt the tissue and reduce the skin paddle, nipples are reconstructed, balancing and symmetrizing procedures are done for the contralateral LAP donor site and contralateral breast, and scars are revised. On a case-by-case basis, in unilateral LAP reconstructions, we make a joint decision with the patient as to how to manage the contralateral lumbar region for symmetry (liposuction or resection), or preserve this donor site for possible future reconstructive options.

CLINICAL OUTCOMES AND COMPLICATIONS

The ideal outcome of LAP flap reconstruction is simultaneous breast reconstruction and aesthetic body

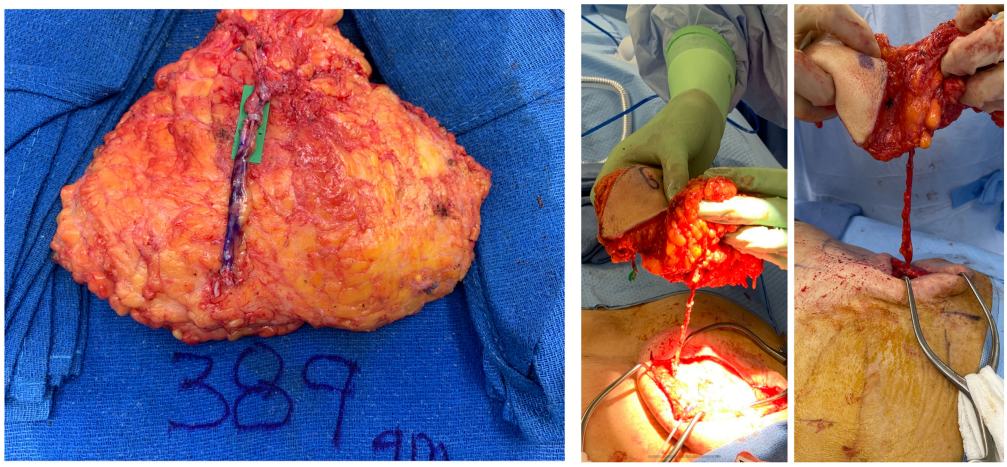

Figure 8. AV graft back table anastomosis. AV: Arteriovenous.

Figure 9. Bilateral LAP flap Reconstruction (mastectomies, reconstruction, and body transformation). LAP: Lumbar artery perforator.

contouring as the "love handle" tissue is converted into a breast [Figure 9]. Harvest of tissue from the lower back and flank has the net effect of narrowing the patient's waist, lifting her buttock, and accentuating the feminine lower back curvature. While the LAP flap is an excellent option for breast reconstruction, most surgeons generally do not consider these flaps as a "first-line" donor site if the abdomen has sufficient tissue suitable for restorative breast surgery. This is generally because of the higher rate of complications and flap loss associated with LAP flaps in comparison to DIEP flaps[15]. In general, the LAP flap is associated with more arterial complications than DIEP flap surgery. For this reason, we are meticulous with the anastomosis of the graft to the artery. If the artery does not allow for coupling without fracture of the intima layer, we handsew the anastomosis with 10-0 nylon. In addition to flap loss, significant donor site complications include seroma, hematoma, changes in sensation including numbness in the lower back and upper buttock, incision breakdown, and contour abnormalities. Seroma formation at the donor site has been reported, as the lymphatics near the fascia overlying the paraspinal musculature can be disrupted

during flap dissection[19]. Drains are often required for 4 or more weeks postoperatively. In some cases, when seroma occurs following drain removal, the seroma will spontaneously resolve over the course of several months, but surgical revision is sometimes necessary for persistent seroma. Transection of sensory nerves during flap harvest alters the sensation in the donor site, and as such, nerves should be repaired if possible. Lastly, the waist may require additional liposuction in the revision stages of reconstruction to create a symmetric and aesthetic contour in patients who undergo unilateral LAP flap procedures.

SUMMARY WITH KEY POINTS

- Lumbar artery perforator flaps serve as a valuable alternative for autologous breast reconstruction when the abdominal donor site is not feasible.
- Achieving a reliable reconstruction with lumbar artery perforator flaps often involves arterial and venous interposition grafts.
- The lumbar perforator flap exhibits similarities to the technique employed in posterior body lift cosmetic surgery, ensuring an outstanding aesthetic outcome at the donor site.

DECLARATIONS

Authors' contributions

Wrote the manuscript: Fisher MH
Edited the manuscript, provided photos and figures: Greenspun DT

Availability of data and materials

Not applicable.

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None.

Conflicts of interest

Both authors declared that there are no conflicts of interest.

Ethical approval and consent to participate

Informed consent to participate was obtained from all patients.

Consent for publication

Informed consent for publication was obtained from all patients.

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